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ABSTRACT

After a state-wide study, the Maryland Commission on Environmental Education submitted the final report to the Governor and the General Assembly. Embodied in the report were six recommendations for the future of environmental education in Maryland. The necessity for a strong public commitment by the Governor and members of the General Assembly was recognized for an excellent environmental education program. Also, it was recommended that a Maryland Office of Environmental Education be established and adequately staffed and funded. Both public and private school systems were urged to develop environmental education programs in their elementary and secondary schools; and, beyond the grades K-12, some emphasis should be placed in community and continuing education programs. On the collegiate level, there was a call for more research and teaching in the environmental sciences, with adequate funding. Finally, it was recommended that environmental centers be developed in areas throughout the state that can be used by maximum numbers of students. (MA)

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# REPORT TO THE GOVERNOR OF MARYLAND

and

# MARYLAND GENERAL ASSEMBLY

*From the Governor's Commission on Environmental Education*

January 1972

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EDWARD HYDE MORSE
CHAIRMAN

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STATE OF MARYLAND

# GOVERNOR'S COMMISSION ON ENVIRONMENTAL EDUCATION

December 31, 1971

Governor Marvin C. Mandel
State House
Annapolis, Maryland

Dear Governor Mandel:

I have the honor to submit herewith the final report of the Commission on Environmental Education. There are six recommendations which would require both Executive and Legislative action plus a strong moral commitment from both.

In the very widest sense, environmental education is already broadly disposed in our society. It exists vertically and horizontally through all ages and economic levels, in education and government, in our business and industry and in our private lives.

The Commission believes, however, that environmental education urgently requires strong encouragement and reasonable organization. The net effect will impart knowledge, encourage concern and promote actions which create and maintain optimal relationships between man and the environment.

Environmental education is above all necessary -- as necessary as law and order; taxes and equal rights; government and education, for if we do not teach all of our citizens to care for this their land in which they live, they will destroy it and themselves and all the other reasons for our being will be for naught.

Respectfully,

Edward H Morse

Edward H. Morse, Chairman

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## RECOMMENDATIONS

1. That the Governor of Maryland and key leaders in environmental and educational positions express vigorous public commitment to the achievement of an excellent Maryland Program in Environmental Education.

COMMENT:

A program which reaches all Maryland residents with sufficient impact to assure enduring environmental interest and concern will require extraordinary leadership from the state executives and from those who must lead the many pertinent changes in agencies and institutions. The Commission is convinced that the public will at this time respond favorably to such leadership, respect those who display it, and support a progressive program. After reviewing many of the related efforts in other parts of the nation, the Commission is impressed by Maryland's pioneering efforts in creating the Commission and charging it with proposing a Maryland Program. This state has now the opportunity to achieve rapidly a position of national prestige and distinction in this universally important field.

The first essential requirement is visible enthusiasm and aggressive participation by the Governor and other prominent persons. Therefore, we respectfully suggest that the Governor arrange and encourage suitable public endorsement and support of the Maryland Program in Environmental Education by his office and by others. Those involved in a successful effort must at least include appropriate leaders in the General Assembly; the Superintendent of Education and Board of Education (who are already enthusiastic and active); the Secretaries of Natural Resources, Health and Mental Hygiene, and State Planning; the State Board of Agriculture; the Maryland Council on Higher Education; the Presidents of colleges and universities in Maryland; and the members of this Commission, representing the principal agencies as well as broad citizen interest.

These leaders can immediately initiate important parts of the program by directing their staffs to emphasize environmental education; to reorder priorities in present budgets and efforts so that emphasis is achieved and to cooperate fully and constructively in planning and implementing the full program.

2. That a Maryland Office of Environmental Education be established, with full-time staff and appropriate operating budget, to be guided by a suitable Advisory Council for the purposes of stimulating and coordinating the many interactive parts of the Maryland Program in Environmental Education.

COMMENT:

The Commission members, and all who give serious consideration to environmental education, recognize that it involves broad human

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experiences. The program must therefore involve the public and private education systems; many agencies of local, state and federal government, pertinent citizen groups; educational institutions and other action centers. The Commission is unanimous in conviction that strong positive commitment and direction are immediately urgent at the highest levels of government and throughout all appropriate agencies and institutions.

Our first inclination was, therefore, to urge the establishment of a new Director of Environmental Education responsible only to the Governor of Maryland and supported by authority to achieve prompt response and cooperation from all necessary agencies and institutions. This might make it possible to override inherent bureaucratic slowness and parochial competition. Such an appointment would, however, have the disadvantages of maximum political vulnerability for an educational program and of being inconsistent with the present Maryland executive trend of fusing isolated commissions and offices into more efficient groupings.

Failing this and as an alternative, we would suggest that the new Office of Environmental Education be established within an existing institution and that it be vigorously assisted by a capable Advisory Council. Thus, we would recommend that his Office be placed within the Natural Resource Institute of the University of Maryland, which has been involved effectively in environmental education for more than thirty years, which contains a modest Department of Environmental Education, and which has broad experience in cooperation with and coordinating programs involving multiple institutions and agencies.

The Director of the Office will require suitable quarters, stenographic and professional assistance, and adequate funds for travel, communications and other activities necessary in his roles as catalyst, stimulant and coordinator. In addition, the Office would continuously inventory the existing efforts in environmental education, provide information to agencies, the General Assembly and the public, seek appropriate grants and contracts, and report annually to the Governor, General Assembly and participating agencies and institutions. The Commission suggests that at least $50,000 should be available for the first year of the Program and that subsequent funding can be sought from State, federal and private funding sources.

The Advisory Council should assist the Office of Environmental Education and extend its effectiveness. Therefore, the members must be appropriate individuals drawn from participating agencies and institutions, leaders of appropriate citizen and educational organizations, and key individuals in government. Perhaps fifteen to twenty individuals should be involved, and their selection should reflect the need of the Council and Office to understand and work with the Governor, General Assembly, Maryland Council for Higher Education, Department of Education, Department of Natural Resources,

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Department of Health and Mental Hygiene, State Board of Agriculture, Department of Transportation, U. S. Office of Education, National Science Foundation, the colleges and universities of Maryland, local educational systems (public, private and parochial), citizen organizations, industry, labor organizations and many others.

The Advisory Council should review existing parts of the Maryland Program and recommend improvements, assist in achieving cooperation throughout the State, recommend the sources and allocation of resources to the parts of the Program, develop and recommend the program for completing the appropriate pattern of Maryland Environmental Centers, suggest any required legislation and conduct such other advisory and complementary activities as may be necessary to implement an excellent Maryland Program in Environmental Education in the most rapid feasible way.

3. That the public and private educational systems of Maryland establish Environmental Education as a priority emphasis and encourage and assist in implementing that emphasis at all levels and in all parts of each system.

COMMENT:

The Commission created Committees on Primary Education and on Secondary Education and participated in the development of the Report of the Superintendent of Education's Task Force on Environmental Education, which provides twelve specific recommendations for effective emphasis on the environment in education in the public schools, especially attention to the program from kindergarten through twelfth grade. (The Committee Reports are presented in Appendices B and C, and the Task Force Report in Appendix D.) Imaginative but realistic suggestions are provided for action by the State Board of Education, the State Department, and county and city educational agencies. Special emphasis is placed in curriculum improvement, excellent curriculum materials, local environmental study areas, cooperation with state environmental agencies, regional environmental education centers, suitable training of teachers, and early implementation of the total Maryland program. The Report was adopted by the State Board of Education on August 25, 1971, and the Superintendent was instructed to proceed apace to implement the recommendations.

The Commission on Environmental Education has enthusiastically endorsed the principles and concepts of this innovative Report, and recommends that the concepts be utilized as well by the private and special schools in the state.

The Commission provides in subsequent recommendations its suggestions for several important activities which complement the emphasis and programs in schools, but recognizes fully that the future attitude and achievements of individual Maryland citizens depend heavily upon the education in schools.

Environmental education in schools is absolutely essential, and must receive adequate moral and financial support if the Maryland Program is to train new generations more wisely.

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4. That an effective and adequate program of community and continuing education related to the environment be designed and implemented in Maryland.

COMMENT:

Every person is involved in decisions and actions related to the environment, and the Commission finds an urgent need for improvement in the opportunities available for education of those not enrolled in formal programs. Continuing education is both diverse and complex, involving as it does such programs as those conducted by the Agricultural Extension Service; the continuing flow from such educating media as television, radio, commercial and special magazines, and newspapers; courses available at community colleges and the proposed Environmental Centers; educational efforts by industry; and many other portions of organized or casual personal experience.

A Committee of the Commission has provided an excellent report in this field (Appendix E), and specifically recommends improvement in the credit arrangements for special courses, development and full community use of the Environmental Centers, continuing review and coordination among the many pertinent agencies and organizations, and maturation of a master plan for continuing and community education. The Commission commends the Report to the attention of those who can improve this diffuse but exceptionally important part of the Maryland Program.

5. That collegiate and post-collegiate teaching and research related to resource and environmental fields be substantially enlarged and more effectively focused to produce technicians, teachers, specialists and well-informed citizens for Maryland.

COMMENT:

Environmental problems and progress are complex and difficult, and the educational processes require professional guidance. Preparation for professional participation in both requires appropriate education beyond the secondary level. There are examples of collegiate and post-collegiate programs in some Maryland colleges and universities and some of them are notable and highly productive, but the Commission recognized early in its discussions that this whole field merited constructive analysis. A Committee on College Education has, therefore, taken an extensive inventory of current college-level efforts in environmental fields and developed recommendations tailored to fit Maryland's needs and institutions. These are presented in detail in Appendix F. The Commission urges that they be implemented.

We recommend increased opportunities for environmental learning for the general student and resource major at the college level, including liberal arts interdisciplinary majors in environmental studies; and expanded training of elementary and secondary school teachers in both pre-service and in-service programs. Further, we urge continuation and

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expansion of the training of specialized environmental technicians in a two-level system - one for the two-year college program, where many essential skills can be provided for certified technicians and where students can be prepared for advanced study, and one for the four-year college sequence in public and private institutions, where biologists, chemists, planners, resource administrators and others can be given complete special training or preparation for graduate education. The Committee emphasized the desirability of creating a central office for coordination, information, materials and communications as well as the unique values which the Environmental Centers can contribute to the collegiate programs.

Graduate education and research opportunities are indispensable for those who must produce new and improved comprehension of the environment and its continuous interaction with man. Maryland must rapidly learn more about the urban, suburban and rural environments of its citizens and how to manage them optimally. We must also improve our understanding of the educational techniques which impart environmental awareness most efficiently. To meet these needs, the graduate and research programs of universities require special support. The Committee emphasized that the University of Maryland, the cap-stone of the public education systems, should play a principal role in the advanced program in environmental education and research.

6. That Environmental Centers be developed in Maryland, in sufficient number to provide all primary and secondary students with vivid personal experience in environmental learning, and to serve as centers for all activities under the Maryland Program in Environmental Education.

COMMENT:

The Commission has been especially impressed by the exceptional effectiveness of intensive personal experience by students in gaining information, concepts and attitudes relating to the environment. Such experiences have been arranged by several counties in programs in outdoor education, and many capable teachers have recommended nature trips and field courses to help students learn. One of our strongest specific recommendations is based upon the conviction that every student should receive two such experiences. The first would occur in his own kind of environment (city, suburban, rural area) while he or she is in elementary school and studying his immediate world. The second would occur in a different environment during a secondary school, when he or she is learning his relationships to the larger world. Each would be a live-in experience of about one week.

From this concept of two separate weeks of intimate education and experience with the environment, the Commission has matured the concept of Maryland Environmental Centers (a Committee Report is presented in Appendix G). Each would be a place for school-age live-in experience, and also a regional center for continuing education in environmental fields, teacher training, research in education, production of new materials for environmental education, conference center, and focal point for relating citizens and students to public environmental agencies.

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Some of these must be new, because no suitable facility exists at some important locations and because genuinely original and innovative planning is required to produce the best possible Centers. Other Centers can utilize and complement existing activities, such as colleges, state parks, youth centers, buildings which are available because previous activities have been discontinued, or other appropriate opportunities. Every such possibility should be fully utilized, if it effectively meets the needs of a Center.

The Commission recommends that the proper objective is an entire state-wide system, sufficient to provide the values of a Center for all Maryland students, without massing students in groups so large as to interfere with effective environmental education. As a realistic first step, the Commission urges that immediate efforts be made to create at least two or three Maryland Environmental Centers. These will provide important experience in the construction and operation of Centers and improve the effectiveness of future additions. We urge that one Center be established in our most complex urban area, namely Baltimore City; one Center be established in a rural location to be selected with guidance of the Director and Advisory Council; and one Center be established in cooperation with one of the two-year or four-year colleges in the state. Each should be supported by appropriate funds for facilities, staff, and operations. Subsequently, an orderly long-term program can be made and implemented for meeting the total objective within the next two decades.

As far as the Commission can determine, the concept and scope of this plan for Environmental Centers is unique to Maryland. We believe that it can make extraordinary contributions to the needs of Maryland's present and future generations, and it may also demonstrate outstanding leadership by this State.

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# APPENDICES

A. Report of the Joint Committee on Definition and Objectives of the Governor's Commission on Environmental Education and Superintendent's Task Force on Environmental Education - Dr. James W. Latham, Jr., Chairman

B. Report of the Committee on Primary Education - Miss Eunice Burdette, Chairman

C. Report of the Committee on Secondary Education - Mr. James G. Nelson, Chairman

D. Report of the Advisory Committee for Environmental Education to the Maryland State Superintendent of Schools, July 1971 (Also referred to as Superintendent's Task Force on Environmental Education) - Dr. James W. Latham, Jr., Chairman

E. Report of the Adult Education Committee - Mr. Edwin M. Barry, Chairman

F. Report of the Committee on College Education - Prof. Don A. Emerson, Chairman

G. Report of the Joint Committee on Environmental Centers of the Governor's Commission on Environmental Education and Superintendent's Task Force on Environmental Education - Dr. L. Eugene Cronin, Chairman

H. Roster of Some Environmental Education Organizations and Efforts in Maryland

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APPENDIX A

# REPORT OF THE JOINT COMMITTEE ON DEFINITION AND OBJECTIVES OF THE GOVERNOR'S COMMISSION ON ENVIRONMENTAL EDUCATION AND SUPERINTENDENT'S TASK FORCE ON ENVIRONMENTAL EDUCATION

## CHARGE TO THE COMMITTEE

The Committee was asked to define environmental education and to develop a set of educational objectives for a Maryland program in environmental education Kindergarten through adult.

## DEFINITION

Preparing people to make those decisions and to take those actions which create and maintain optimal relationships between man and the environment which sustains him.

## OBJECTIVES

1. To impart knowledge of the environment; of its components and interrelationships; and of man's impact on it.

2. To encourage an attitude of concern for the environment and an acceptance of the responsibilities of the individual and groups for the present and future conditions of the environment.

3. To promote those actions which create and maintain optimal relationships among men and between man and the environment. In so doing, the individual will:

   a. support programs to achieve the best possible balance between population and the demands it places on the eco-system.

   b. initiate and support programs designed to prevent deterioration of the environment.

   c. insist that ecological affects be taken into account along with political, economic, social and other factors in decisions effecting the environment.

   d. use wisely the resources of the environment to meet his physical and aesthetic needs.

   e. encourage innovative, imaginative and improved approaches to environmental use.

f. seek information on the availability, status and use of environmental resources and utilize such knowledge in making decisions about his environment.

g. support research designed to determine short and long term effects of man's action on the environment.

h. urge government and industrial application of basic ecological principles for the efficient management and use of renewable and non-renewable resources.

Respectfully submitted,

/s/

James W. Latham, Jr., Chairman
L. Eugene Cronin
James G. Nelson
Everett Pettigrew

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APPENDIX B

# REPORT OF THE COMMITTEE ON PRIMARY EDUCATION OF THE GOVERNOR'S COMMISSION ON ENVIRONMENTAL EDUCATION

## THE PAST AND THE PRESENT

Over the years, there has been an ever-expanding program in presenting material on the environment. In order, the emphasis has been on nature study, general science, conservation, outdoor education, and now, environmental education. While no complete picture is available of what is presently being taught in environmental education in the elementary grades of Maryland, this information is gradually being compiled.

Various counties have designed and implemented programs for outdoor education. While the content of these programs differs somewhat, there are also similarities. Nature walks or hikes, crafts, compass hikes or orienteering, astronomy, bird banding, math, science (principally biology), social studies, and the language arts are important parts of most of the curricula. There seems to be a lack of attention to environments in which people live - urban, suburban, and rural. This is understandable since these programs are for outdoor education. We believe that a change of content and of objectives might be brought about when elementary schools begin to think in terms of environmental education.

## STATEMENT OF PRINCIPLES

The Primary Education Committee believes that the intent of any educational program at the elementary level dealing with the environment should, in keeping with the broad objectives outlined in the Report of the Committee on Objectives, stress a set of principles consistent with these objectives and applicable throughout the educational process. The principles themselves are fundamental and unchanging, but through the educational process, the manner of their presentation will differ with the maturity of the students involved.

We believe that there are three such principles. First, any environmental approach must emphasize the interrelationships among things, be these manmade, technological, or natural phenomena. Whether the words used are "interdependence," "systems," "interaction," "chain of reactions," or "positive and negative feedback," the essential feature is that the phenomena are interrelated. Second, if systems or inter-relatedness are fundamental, then separation of the organic from the inorganic, or the manmade from the natural, is an artificial convenience. Thus "the environment" is not separable into specified niches within the curriculum but involves equally the natural and social sciences. Environmental concepts, then, must be treated wherever they apply and not be isolated. Third, the earth is a closed system. This statement need have no messianic quality but rather introduces into the analysis the necessary physical principles of the conservation of materials. The rule simply states that out of sight and out of mind is not out of existence. Substituting a waste put into the air for a waste thrown into a river is not a disappearing act. One must account for all products and all processes throughout the system. This conservation principle is related to the first two principles, but can be put in more personal terms. The phrase might be "No man is an island," or "One cannot escape." While only generalizations, in reality these three principles (in fact, one) clearly lead to fundamental social, cultural, and economic questions. Problems of growth, distribution, and equity are inherent in environmental considerations.

## IMPLICATIONS FOR THE CURRICULUM

Because the objectives and the principles involved in analysis of environmental concerns of man are so pervasive, one cannot pigeonhole the teaching of such principles within a few courses. Rather, an attempt should be made to incorporate and to illustrate these principles as may be appropriate within the natural, social, and behavioral sciences. Certainly courses can be designed at the elementary level which can be used to illustrate the principles of inter-relationships between man and nature, and between society in general and natural systems. In all likelihood the principles will be much better understood if they appear in the study of history, home, and playground.

## DIFFERENT SOCIAL ENVIRONMENTS

One may treat environmental concerns from many vantage points. At early education levels the most appropriate material may well be concerned with the individual (personal), the school, or the neighborhood. With the growing comprehension of his environment, the child becomes ready to study the city, then the State, the region, the nation, and the world. Regardless of the environment in which one works, the principles should remain the same: it is simply the illustrations that will differ. One could look at what comes into a school and what goes out, how it comes in and how it goes out, just as well as one could look at the necessary service operations of the neighborhood or city. An understanding of the globe and the circulation of currents of air makes it possible to see how the world is physically connected, as well as socially. Thus, the illustrations can be drawn at any level.

While there are differences in environments, the same principles can be applied in virtually every case, even though the models at hand will vary with the background and location of the children involved. There are at least three distinguishable social environments in the State of Maryland: the center of the city, suburbia, and the rural area. The distinctions between these environments are so great that it would be a mistake to assume that educational programs at the elementary level can be developed that are universal in application. We believe that curricula must be developed to acquaint the student not only with his own area, but also with other types of environments.

## TEACHER EDUCATION

We believe that the educational task associated with a concern for the environment is immense. Successful teachers should have a deep insight into the kinds of phenomena with which they must deal in bringing these concepts and objectives within the grasp of their students. Furthermore, while there are many general principles within the sciences and the arts that can be taught, much of the work is in its infancy, and beautifully documented, near-at-hand illustrations are not readily available. Thus, because the material to be taught is complex and much of it is new and controversial, the education of teachers becomes perhaps the most important part of the program. Such teaching must include exposure not only to the out-of-doors but also to the social framework within which much of the environment must be discussed. The too-frequent dichotomy between "nature" and "the city," as if the former were the environment and the latter a distortion of it, must be dispelled.

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RECOMMENDATIONS AND ENDORSEMENTS

In view of the objectives and principles previously stated, we recommend that county and city committees of teachers, supervisors, and lay participants, working within the framework of these objectives and principles, and with the leadership of the State Department of Education, prepare for each local unit a curriculum in environmental education. This curriculum should be broad enough in scope and general enough in nature that teachers could adapt it to their individual classrooms. It should also reflect the specific characteristics of the locality for which it is designed. These committees should not ignore the excellent ground-work already laid by the outdoor-education programs. The person(s) presently involved in these programs should by all means be on the environmental curriculum committee.

We further recommend that the State Department of Education support the local committees with material, suggestions, and funds. If the individual counties wish to combine with nearby counties, this might be helpful; the southern counties are already doing this for much of their "in-service" training programs. If some of the units find it difficult to provide funds for released time necessary for the accomplishment of this task, monies should be made available.

We strongly endorse both the recommendations of Dr. Robert Menefee on Environmental Education Teacher-Preparation Program, as given to the group at the Wye Conference, and the establishment of the Environmental Centers. The various disciplines represented by the speakers at the Wye Institute Joint Meeting on December 2-3, 1970, indicate the broad spectrum of material that should be considered in developing guidelines for subject matter.

Respectfully submitted,

/s/

Eunice Burdette, Chairman
Claire A. Richardson
M. Gordon Wolman

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APPENDIX C

# REPORT OF THE COMMITTEE ON SECONDARY EDUCATION OF THE GOVERNOR'S COMMISSION ON ENVIRONMENTAL EDUCATION

## CONCLUSIONS AND RECOMMENDATIONS

(1) The Committee accepts the definition of environmental education and the statement of objectives proposed by the Joint Environmental Education Sub-Committee.

(2) The Committee endorses the report of the Joint Committee on Environmental Centers and agrees enthusiastically in the recommendations that: (a) the program of those facilities would include general activity and specific projects for secondary school students, and (b) one function of the Centers would be to provide a central source of materials relating to environmental education and a site for production and collection of new materials for use in schools and in the community.

Note: As concerns (b) above: Even at best a good deal of time may elapse before Environmental Centers, as presently envisioned, become a practical reality. In the view of the Committee on Secondary Education, the educational materials center need not and ought not be delayed until that time. Rather, it is hoped and urged that this resource be organized and established at some existing location now and activated as soon thereafter as practicable.

(3) The Committee believes that Environmental Education should not be "taught" in the secondary school as biology, chemistry and physics are taught. This is not to say, however, that the subject has no place at this educational level. Indeed, at least three approaches which would assure that this field of interest receives meaningful and productive attention and action are immediately apparent, and, in our opinion, merit thoughtful consideration.

(a) Honest acceptance--by administration and faculty--of the proposition that environmental education is a proper responsibility of the secondary school. Genuine commitment --by administration and faculty--to the tasks of "imparting knowledge of the environment, encouraging an attitude of concern for it, and promoting actions which create optimal relationships between man and the environment." Both the acceptance and the commitment must be encouraged and strengthened by the active, participating support and endorsement of municipal, county and state boards and departments of education.

(b) Wherever practicable, related and plainly pertinent "environmental" intelligence should be integrated naturally within appropriate units of the established curriculum. A practical first step may be to cross-reference by curriculum area those books, films and other items inventoried at the resource center. This action would equip even the most inexperienced teacher to make enlightened use of environmental education materials. A sophisticated extension of this service could be the design and development, by the center, of curriculum integration manuals which suggest reasonable ways and means of relating environmental information to any or all the arts, sciences and humanities.

(c) Interdisciplinary enrichment activities related to the study of the environment should be "laid on" as imaginatively as the mind admits and as lavishly as the budget allows. The purpose of these activities would be to stimulate interest, to provide new "environmental" experiences, to instill appreciation, and to engender an understanding of method, thereby broadening the student and encouraging him to educate himself. Some possible activities are listed below.

(i) Resident programs for students and teachers at Environmental Centers, camps, cities, parks, farms, laboratories or ships afloat.

(ii) Films and professional presentations in other media supplied by the resource center. (Where practicable, these materials might also be produced on a project basis by students and teachers working together.)

(iii) Lecture-discussions and demonstrations by visiting specialists from industry, government and higher education. Organization and management of such a "speakers bureau" would seem to be a logical extension of the work of the materials resource center.

(iv) Field trips, mainly by small groups, to points of special interest in both natural and man-made environments.

(v) "Workshops" with municipal, county and/or state resource agencies on a released-time basis for selected students who demonstrate special interest or outstanding talent or ability in a given "environmental" field.

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Note: Some means must be achieved to effect a continuous dialogue between secondary schools and local and state resource agencies leading to a constructive exchange of information and possible cooperative projects. (See, also, items (vi), (vii), (4) and (5) which follow.)

(vi) Participation in community "environmental" projects either school initiated and directed or in cooperation with and/or supervised by appropriate agencies of local or state government.

(vii) Attendance and possible participation on a regular basis (by selected students who, in turn, would report to a larger group) at meetings, hearings, conferences and other public activities of local government resource agencies.

(viii) Interscholastic activity, including competition for "environmental" awards, in the arts, literature, project presentation, et cetera.

(4) The Committee recommends that the vocational-technical curriculum of high schools be examined for possible addition of locally logical "environmental" courses on either an in-school or a field extension, work-study basis with appropriate industry or local or state resource agencies.

(5) The Committee recommends further that career development programs in the secondary school be expanded to provide due consideration of and counseling for jobs, training and higher education in this field of interest.

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AN ADDENDUM TO THE REPORT OF THE COMMITTEE ON SECONDARY EDUCATION OF THE GOVERNOR'S COMMISSION ON ENVIRONMENTAL EDUCATION:

Several years ago a three-man Council on Environmental Quality established by Congress statedthe following: "Ecology need not replace any particular existing course of study...there is need, however, for interdisciplinary education to cope with the interrelated nature of the environment. It is clear that man does not know enough about the environment around him and what he is doing to it." Partly to reinforce the above position and to offer specific recommendations as a member of the Secondary Committee, the following points are suggested for possible consideration:

1. That a K-12 team of teachers, reinforced, if possible, by specific specialists in the area of effective environmental education, be formed to research existing interdisciplinary programs in the public schools nationally.

2. That a full-time Coordinator (salary paid from Maryland State Department of Education budget) be assigned to supervise this K-12 team.

3. That this K-12 team set for their major task the development of salient interdisciplinary objectives, teaching strategies, and adequate content guides for the daily teaching task.

4. That this team be assigned the charge of producing an Environmental Education Handbook for Teachers, K-12. This Handbook should especially contain reasonably-designed activities by Grade Level.

5. That adequate funds be appropriated for the carrying out of the above suggestions in order that this K-12 team become an on-going production team effort.

L.J.K. (5/27/71)

Respectfully submitted,

/s/

James G. Nelson, Chairman
Leon J. Klompus

APPENDIX D

# REPORT OF THE ADVISORY COMMITTEE FOR ENVIRONMENTAL EDUCATION TO THE MARYLAND STATE SUPERINTENDENT OF SCHOOLS - JULY 1971

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Resolution
Maryland State Board of Education
January 28, 1970

Resolution No. 1970-15

RE: Institution of a planned program of environmental education in all Maryland elementary and secondary schools.

WHEREAS, Education is a process through which citizens understand their responsibilities for the conservation of the human environment; and

WHEREAS, Understanding and respect for the natural world and its complex balances must be developed and sustained; and

WHEREAS, Each student needs to develop an understanding of the ecological relationship of man to his environment; and

WHEREAS, The public schools have a responsibility for developing in each student an awareness of his environment; now, therefore, be it

RESOLVED, That the State Board of Education supports the initiation of a program of environmental studies in all public schools of Maryland; and be it further

RESOLVED, That the State Board of Education urges the establishment of a program of environmental studies as a planned part of the curriculum in all elementary and secondary schools in Maryland.

STATE ADVISORY COMMITTEE ON ENVIRONMENTAL EDUCATION

Appointed by Dr. James A. Sensenbaugh

March 10, 1970

CHAIRMAN: Dr. James W. Latham, Jr., Consultant in Science
Maryland State Department of Education

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Maryland State Department of Education
Mr. Robert B. Cochrane, Assistant General Manager and
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Mr. Rankin Lusby, Executive Secretary
Maryland Farm Bureau
Mr. Robert Mancke, Health Educator
Maryland State Department of Health
Dr. Robert Menefee, Assoc. Professor of Sci. Ed.
University of Maryland
Mr. Frank Mentzer, Park Superintendent
Catoctin Mountain National Park
Mr. Roy Okan, Elementary Science Supervisor
Frederick County Public Schools
Mr. Elra Palmer, Supervisor of Science
Baltimore City Public Schools
Mr. Everett Pettigrew, Elementary Supervisor
Anne Arundel County Public Schools
Mr. Paul Rusko, Specialist in Physical Education
Maryland State Department of Education
Mr. Irwin Snyder, Maryland Association of Sanitarians
Miss Doris E. Terry, Specialist in Health Education
Maryland State Department of Education
Mrs. Edith Whiteford, Director of Education
Maryland Academy of Sciences
Mr. F. Phillip Williamson, The Point
Cambridge, Maryland
Mr. Tom Wisner, Specialist in Education
Natural Resources Institute at Solomons

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Report of the
Advisory Committee for Environmental Education
to the
Maryland State Superintendent of Schools

July 1971

## Background

On January 28, 1970, the Maryland State Board of Education adopted resolution #1970-15 for initiating a planned program of environmental education in all Maryland elementary and secondary schools. In order to implement the resolution, Dr. James A. Sensenbaugh, State Superintendent of Schools, appointed an Advisory Committee for Environmental Education on March 10, 1970. The Committee was asked to develop a statement of beliefs, to provide direction to the State Department of Education for overall long-range goals, and to develop specific recommendations for immediate action. The first meeting of the State Advisory Committee was held on Earth Day, April 22, 1970. The group selected the fourth Wednesday of each month as a regular meeting date and identified July 1971 as the date for presenting a final report to the State Superintendent.

## Statements of Belief

As a basis for their recommendations, the Advisory Committee developed the following statements of belief:

1. The environment is not already in a hopeless condition. Through positive action and approaches, appropriate changes can be accomplished.

2. The problems of the environment were caused by people and should become the concern of people. Man must learn to live with Man and nature.

3. Earth Day and Earth Week must not become just a fad. There is a matter of urgency to environmental education. Perhaps human survival is at stake. Environmental education should be part of the planned program of education.

4. Environmental information needs to be communicated to all individuals. If citizens are to act intelligently regarding the problem, they must be informed. They need to know what the environmental problems are, what standards of control exist, and what technology can do.

5. The way economic factors shape the individuals attitude about the environment needs careful study.

6. There are some very positive things happening in the State and nation relative to a better environment.

7. Teachers will have an important role in environmental education. Changes in the preservice and inservice training programs of teachers will be necessary if they are to fulfill their role.

8. Existing educational programs should be surveyed to identify what is now being done in environmental education and to identify what should be introduced or modified.

9. Student action programs which result from instructional activities and which involve the student in some form of community action project need to be identified and established.

10. Environmental education should be an inter-disciplinary program.

11. There should be a close coordination between the work of the Superintendent's Advisory Committee and the Governor's Commission on Environmental Education. Some members of the Superintendent's Advisory Committee should be represented on the Governor's Commission.

12. The mass media should be encouraged to continue providing programs designed to keep the population informed on problems of the environment.

## Recommendations

In preparing these recommendations, the Advisory Committee studied

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carefully the implications of State Board of Education resolution #1970-15 which calls for the establishment of a planned program of environmental education in all Maryland schools. The members reviewed various environmental programs that are currently being offered in the Maryland Public Schools and others that are commercially available. Outside consultant advice was utilized. Small working groups studied carefully the following areas: program definition and objectives, teacher education, research, curriculum development, student action programs, adult education programs, environmental learning centers, and implementation strategies. On two separate occasions, the Committee met in joint session with the Governor's Commission for Environmental Education. After fifteen months of intensive study and deliberation, the Committee offers the following recommendations:

Recommendation 1

The State Board of Education accept and adopt the following definition and objectives for a comprehensive State environmental education program:

- Definition - Preparing people to make those decisions and to take those actions which create and maintain optimal relationships between Man and the environment which sustains him.

- Objective - Impart to individuals knowledge of the environment, its components and interrelationships, and Man's impact on it.

- Objective - Develop in individuals, attitudes of concern for the environment and an acceptance of the responsibility of individuals for the present and future condition of the environment.

- Objective - Encourage individuals to take those actions which create and maintain optimal relationships between Man and the environment. In so doing, the individuals will:

- Initiate and support programs designed to prevent deterioration of the environment.
- Support programs to achieve the best possible balance between population and the demands it places on the eco-system.
- Insist that ecological effects be taken into account along with political, economic, social, and other factors in decisions affecting the environment.
- Use wisely the resources of the environment to meet his physical and aesthetic needs.
- Encourage innovative, imaginative and improved approaches to environmental use.
- Seek information on the availability, status and use of environmental resources and utilize such knowledge in making decisions about the environment.
- Support research designed to determine short and long term effects of Man's actions on the environment.
- Urge government and industrial application of basic ecological principles for the efficient management and use of renewable and non-renewable resources.

Recommendation 2

The State Board of Education establish in 1971 environmental education as an area of curricular priority for all Maryland schools for at least the next 5 year period. A long range plan should be developed and implemented.

- Appoint in late 1971, a staff member to organize, coordinate and direct a comprehensive program of environmental education. He should be charged with the responsibility of accomplishing the program objectives and should be provided with adequate staff and funds to execute his responsibility.
- Assign, effective January 1, 1972, staff consultants and specialists in the areas of science, social studies, humanities and outdoor education to allocate approximately 50% of their time to this program.

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- Appoint in 1971, a State Citizens Advisory Committee for Environmental Education. The Committee should provide advice in the area of environmental education and should review periodically the plans and progress being made by the State Department of Education. The Committee should be properly compensated.

- Seek and use immediately State, federal, private and local government funds to develop and implement curricular programs in the area of environmental education.

- Direct each local educational agency to establish environmental education as a high priority area by late 1971. Suggest the appointment of a staff member to coordinate the program in each local agency.

- Organize and provide by 1972 specialized environmental education training for leadership teams of curriculum specialists from each of the local educational agencies. These specialists should have curricular responsibilities respectively for science, social science, and the humanities. This training should be provided cooperatively by the Department of Education and the Maryland Institutions of higher education. It could possibly be funded by a school-college cooperative program of the National Science Foundation.

Recommendation 3

The Maryland State Department of Education, working cooperatively with representatives of the local educational agencies, construct a curricular framework for a comprehensive State environmental education program.

- Restructure existing curricular areas rather than introduce environmental education into the schools as a new course. Flexibility should be provided which also permits the establishment of some new environmental education courses in secondary schools.

- Build environmental education programs around the concept that young learners should study the environment of the home and the school. As the learner grows older, the emphasis should shift to the community, the region, and the universe.

- Build the content around the following themes: patterns, interrelationships, change, and eco-systems. These topics

should include political, socio-economic, ecological and aesthetic considerations.

- Include valid environmental issues in the curriculum even though they may be controversial.

Recommendation 4

The Maryland State Department of Education and the local educational agencies provide the curricular materials needed for implementing a total program of environmental education.

- The Maryland State Department of Education should identify and evaluate available environmental education materials in all media which support the objectives of the Maryland program.

- Each local educational agency should identify the teaching materials currently used in teaching the objectives of the program in the local agency.

- The Maryland State Department of Education should fund and provide the leadership for developing and disseminating curricular materials. Priority should be given to the development of appropriate media productions on the resources of Maryland.

- The Maryland State Department of Education should fund, establish and operate an environmental education curriculum service center to assemble and disseminate existing materials in all media and to develop and disseminate new materials.

Recommendation 5

The Maryland State Board of Education direct each local educational agency to initiate immediate action to incorporate environmental education into the curriculum.

- Each local educational agency should develop a five year plan for implementing a comprehensive program of environmental education. The State Department of Education should provide whatever assistance is needed to accomplish this.

- During 1971-72 each local educational agency should provide that all schools include at least two environmental education units in each of the following grade ranges: K-2, 3-5, 6-8, and 9-12. One unit should

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focus on an eco-system that is relatively undisturbed by Man. The second unit should focus on an eco-system in which Man is the dominant force.

- Each local educational agency should establish a citizens advisory committee for environmental education. This committee will be the counterpart of the State Advisory Committee performing a similar function at the local level.

Recommendation 6

The Maryland State Board of Education recommend that every school site contain an environmental study area.

- The State Board of Education should revise school site standards to include environmental study areas. All elementary school sites should include at least two acres for environmental studies (beyond normal site standards) plus an additional acre for each 100 students beyond 500. All secondary school sites should include at least 5 acres for environmental studies (beyond normal site standards) plus an additional acre for each 200 pupils beyond 1,000. Consideration should be given to meeting these minimum standards by locating schools adjacent to parks or other appropriate public or public utility open spaces. Where this is not possible, consideration should be given to arranging for use of contiguous or readily accessible privately owned lands.

- The Maryland State Department of Education should require that all Maryland schools have a landscaping plan for the total school site which enhances the environmental study possibilities of that school.

Recommendation 7

The Maryland State Board of Education direct the local educational agencies to work cooperatively with the Department of Parks and other appropriate public and private organizations to assure that each high school and all its feeder schools have at least one park or natural area with which it is directly affiliated.

- Each local educational agency should work with the Department of Parks and other appropriate public and private organizations in the expansion of environmental interpretive programs in parks and natural areas. These can be used for student as well as adult education.

Recommendation 8

The Maryland State Department of Education establish and provide for the operation of regional environmental education centers.

- These centers should provide for the following:
  - At least two separate one week live-in experiences for all children at different centers during the course of their K-12 education program.
  - Day visits from regional schools and groups.
  - Adult programs including both formal arrangements such as courses and seminars and informal opportunities for families.
  - Training of teachers at all levels in relation to environmental education.
  - A central source of material relating to environmental education.
  - A site for the production of new and improved curricular materials for use by the schools and adult groups in environmental education.
  - Graduate research in environmental education working in coordination with appropriate institutions of higher learning.
- These centers should be located to represent different geographic regions of the State. Facilities should be provided at: the Atlantic Coast, the Eastern Shore, Central Maryland, Baltimore City, the Chesapeake Estuarine System, the Mountains and the Suburbs.
- These centers should encompass the concept of cooperative use of already owned State or county properties.
- A schedule for the establishment of three centers should be set; one to serve an urban environment, another in a marine or maritime region and another in a mountain site.
- Planning money for the construction for three centers should be obtained in fiscal '72 and plans should be rapidly developed by an excellent team of appropriate people. Capital funds should be obtained and the centers should be well developed in fiscal '73.

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Recommendation 9

The Maryland State Department of Education work cooperatively with Maryland institutions of higher education for the purpose of incorporating environmental education into the preservice and continuing education programs of teachers.

- In late 1971, the Maryland State Board of Education should appoint a task force to suggest ways of restructuring undergraduate education programs of all teachers to include needed training in the area of environmental education. By late 1972, the Maryland State Department of Education should begin providing environmental education inservice programs for teachers at all levels through appropriate funding and leadership.

- Leadership at the local level will be provided by a corps of environmental specialists trained through a cooperative Maryland State Department of Education higher education effort previously described.

Recommendation 10

The Maryland State Department of Education establish and support student activity programs in environmental education.

- By January of 1972, the Maryland State Board of Education shall establish April as Earth Month and identify it as a time for the schools to place particular emphasis on the improvement of environmental conditions in their local community.

- The Maryland State Department of Education should encourage student and teacher involvement in seeking solutions to local environmental problems.

- The Maryland State Department of Education should conduct a series of regional environmental education symposia with broadly based student participation.

- The State Department of Education should provide funds for the support of student or teacher projects in environmental education which appear to have exceptional value.

Recommendation 11

The Maryland State Board of Education require all Maryland school officials to consider the ecological implications of their acts

in the location, design, construction and operation of all Maryland Public Schools.

Recommendation 12

It should be the policy and practice of the Maryland State Department of Education and of its staff to seek counsel and participation from, and actively cooperate with, all appropriate federal, State, local and private agencies to achieve the best possible total program in environmental education for all the people of Maryland.

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# REPORT OF THE ADULT EDUCATION COMMITTEE OF THE GOVERNOR'S COMMISSION ON ENVIRONMENTAL EDUCATION

## RECOMMENDATIONS

1. Support the Federal Health, Education and Welfare, and Maryland State Department of Education in a long-range planning and coordination effort similar to that legislation now before the Congress, Senate Bill 1037 and House Bill 5292.

2. Establish a council on Adult Environmental Education under the jurisdiction of the Maryland Department of Education.

3. Apply for Federal and/or foundation funds to make an indepth study of the present and future resource needs of Adult Environmental Education.

4. Review the certification and course credit structure of continuing education schools - community (junior colleges) and associated institutions, for the purpose of coordinating and standardizing such courses, transfers of credits and procedures, which will make education requirements more in line and readily available to all adults in an ever-changing world of skills and technologies.

5. Make an indepth study of Information Education Centers on a regional and county basis.

6. Procure a study grant to survey program needs of adults in Environmental Education and make recommendations accordingly.

7. Establish grants in the fiscal year 1972 for various community college pilot studies to include the following:

   (a) Speakers Bureau.
   (b) Courses and seminars.
   (c) Switchboard telephone service for "hot-line" communications with the public.
   (d) Information banks.
   (e) Human, Industrial and Natural, Resource tours of the community for familiarization with on-site problems and solutions.
   (f) Develop mobile ecocenters for exhibits, information, etc.
   (g) Provide community forums and symposiums developed by community interest and carried out by them.

8. Within an Environmental Education Council establish ad hoc committees on:

   (a) Extension service programs, all agencies.
   (b) Pilot studies in recognized communities where environmental studies are now on-going.
   (c) Determining attitudes and activities of trade unions and associations, foundations and other institutions and their inputs into these programs.

(d) Request and secure services of industry in providing community participation and leadership, particularly through the Chamber of Commerce and other related organizations.

(e) Survey of government organizations relating to environmental services to determine their training programs and educational features.

(f) Survey the media and evaluate television, radio and newspaper services, and review and report on their future roles in environmental education.

(g) Inventory community and civic organizations and determine their role, facility and function in providing environmental action programs and activities for adults.

9. Provide a house organ through the Department of Education on a weekly or monthly basis which coordinates and informs all interested citizens in the actions of the environmental centers, listing recent publications and legislation of interest to adults.

10. Recommend the continuing study and review of community organizations as an important force in developing information education centers and provide on-going programs.

11. Make evaluations for an environmental education systems approach and establish such methods if approved.

12. Develop a Master Plan which outlines the Adult Environmental Program and courses of action for the period 1973-1983.

Respectfully submitted,

/s/

Edwin M. Barry, Chairman
John H. Cumberland
James Hibbs
Fred Jeffers
Robert Mancke
Edward L. Stock, Jr.
F. Phillip Williamson

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APPENDIX F

# REPORT OF THE COMMITTEE ON COLLEGE EDUCATION OF THE GOVERNOR'S COMMISSION ON ENVIRONMENTAL EDUCATION

## RECOMMENDATIONS

The main possible recommendations fall under four headings, and will be considered in this order: (A) Technical-professional training at the 2, 4, 6, and 8-year levels beyond high school, (B) Liberal arts major in environmental studies, (C) Training of teachers to teach environmental education in grades Kindergarten through 12, (D) Non-prerequisite courses in environmental education at the college level. Additional recommendations concern (E) Environmental centers for college and graduate-level work, and professional solution of local environmental problems, (F) Recruitment of students.

A. Technical training at the 2, 4, 6, and 8-year levels beyond high school.

1. A paid consultant with proper expertise in data collection and evaluation should be employed to project manpower needs in all the fields related to maintenance of environmental quality in the State of Maryland for the next ten years. This study is to be used as a basis for recommendations stated below.

2. A paid consultant with expert training in evaluation of occupational specifications and requirements should be employed. Based on his advice, laws should be drafted and passed changing specified jobs related to environmental quality control (e.g. housing inspector) from the political-appointment system to the merit system; and the necessary specifications and qualifications should be drafted for these jobs.

3. The expert mentioned in 2 above should also re-evaluate positions relevant to environmental quality control which are presently under the merit system, with the aim in view of reducing the educational level of some of them from a bachelor's degree to a specifically relevant two-year college degree.

4. Two-year technical programs:

   a. A conference of relevant personnel of all the two-year colleges in the State of Maryland should be convened at state expense for the purpose of determining, partly in the light of the evaluations listed above, what technical programs related to maintenance of environmental quality are needed, and for allocating programs to colleges in such a way as to maximize the variety of educational opportunities available somewhere in the state while minimizing wasteful overlap of programs between colleges.

   b. A starting point for such allocation should be to continue and strengthen the programs already begun, e.g. pollution abatement technology at Charles County Community College, forestry at Allegany College.

c. Care should be taken not to begin new programs until entirely adequate college-level faculty members and facilities are available. The use of Title III and perhaps MDTA money should be looked into in the case of each program as a possible source of funding high quality personnel and facilities.

d. Provision should be made for monitoring the programs from the state level to assure that they are of good, college-level quality.

e. Recognizing that efficient allocation of programs to two-year colleges as described above restricts opportunities for state residents to get low-cost education in the fields of their choice, we recommend that a state competitive scholarship fund should be provided to assist especially well qualified students who must go beyond commuting distance to train in one of the programs. Scholarship students should be required to work for the state for a specified period of time after graduating, or repay their scholarship money.

5. Four-year, six-year, and eight-year technical programs:

a. Maryland now has a wide variety of these programs available at the University of Maryland and at the Johns Hopkins University, as inspection of Table A in this appendix reveals. Concerning those programs which the state does not now have, we recommend that they not be established here, as that would be more expensive than the need warrants. Rather, then, until the final plan is drafted and effected, we recommend a state competitive scholarship program to send especially well qualified students out of state to enter approved programs. The students would be required to work for the state for a specified time after graduation or repay the scholarship money. Some of the programs which would most probably be included under such a plan are listed below. The approved universities have yet to be specified.

forestry
veterinary medicine
planner and coordinator of environmental education programs for Kindergarten through twelfth grade
urban planning (of broader scope than that in the architecture program at Maryland)
mining
et cetera

b. We recommend that the following professional schools be asked by the state to examine their curricula from the standpoint of their adequacy in emphasizing environmental problems and concerns. If these concerns have been slighted, we recommend that added emphasis and/or additional courses be included in future curriculum modifications at these schools.

School of Law
School of Social Work
Library Science (this one is especially important to the program

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of environmental education per se in view of the stress the entire Commission is putting on establishment of information centers in connection with Environmental Centers and in connection with the schools and the adult education programs.

B. Liberal arts interdisciplinary major in environmental studies

1. Recognizing the need for enlightened citizen education regarding the environmental crisis, and recognizing the need for more emphasis on environmental concerns in such profession fields as law, social work, and secondary school teaching, we recommend that the state encourage the development of interdisciplinary majors in environmental studies in liberal arts college. Specifically, such encouragement might include the following:

   a. The Commission's recommendations favoring this idea should be publicized

   b. Some official group (e.g. Maryland Council on Higher Education) should convene, at state expense, a conference of relevant personnel from interested private and public liberal arts colleges to discuss the idea of such a major and various ways of implementing it.

   c. State funds should be made available upon acceptable application by individual professors or groups of professors to enable them to plan and implement such a major, with the proviso that their work would be made available to other interested liberal arts colleges upon request. Funds would be used to cover freed time necessary for person(s) to plan such a program, develop new courses, and/or have a lightened teaching load in order to participate in multiple-staffed interdisciplinary courses.

   d. Inter-institutional cooperation within a geographical region should be encouraged by favoring requests from inter-institutional faculty committees for the purposes mentioned in (c) above.

C. Teacher training

1. Courses to "update" and continue the inservice training of elementary and secondary school teachers who will teach environmental education should be made conveniently available to all two- and four-year state colleges.

2. Special provision should be made for exceptions to the general state rule that specialized courses taken at two-year colleges cannot be credited toward maintaining certification or eligibility for salary increases. Environmental courses at two-year colleges should be made conveniently available for this purpose through special course-by-course agreement between the two-year colleges and the State Board of Education.

3. A "four location summer workshop" should be started for inservice and pre-service training in which students would go for two weeks to each of four quite different environments in the state and receive intensive on-site education about environmental matters. This, too, should carry credit toward eligibility for salary increments and maintenance of certification.

4. The liberal arts interdisciplinary major in environmental studies should be recommended as one way for secondary school teachers to become certified in a teachable subject (e.g. biology) while developing the broad background necessary for the new work in environmental education.

D. General education

1. All colleges in the state should be encouraged to examine their curricula so as to include as many courses as possible which provide the general student with opportunities to study about the environment without technical course pre-requisites.

E. Environmental centers

1. We recommend that where feasible the environmental centers which will be used for teacher training and Kindergarten through twelfth grade environmental education be located near colleges. Such a location has several merits: it would be economical in terms of use of library, laboratory and other facilities; it should provide college students from a variety of fields an opportunity to work in such centers; and it should make maximally efficient the use of college faculty and other college personnel as resource persons or part-time staff members at such centers.

2. In at least two locations, an advanced environmental center should be established for the express purpose of providing professional personnel and facilities for tackling local environmental problems through coordinated research and application thereof, while providing college students and graduate students field and research opportunities. If possible these centers should coordinate physically as well as functionally certain relevant governmental departments with appropriate educational departments. For example, at Frostburg State College such a center could provide a physical location for a branch of the University of Maryland's Natural Resources Institute, Fish and Wildlife, Forests and Parks, and Department of Water Resources. (The above are all renting now in different locations.)

   Provisionally, we suggest a more rural-outdoor-oriented center in connection with Frostburg State College since it already has a strong undergraduate program in biologically oriented environmental studies (see Table A), and is planning a master's degree in this area; and a center concerned mainly with urban environment at the University of Maryland, College Park (or perhaps at Towson State College).

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First, the central interest of the Center will be the quality of human environment. It is not intended that this limit the Center to studies of environmental pollution in the usual sense of that term. Rather, the Center will be concerned with all environmental factors which affect the quality of life of people in the various situations in which they live and work. Factors having physiological, psychological, sociological, economic, and aesthetic impact will be considered.

Second, the Center's interests and activities will be problem-focused rather than discipline focused. Activities normally will be organized around environmental problems whose solution requires collaboration by faculty members representing several different disciplines. Strength in the supporting basic disciplines will be essential, of course, but will not be a primary responsibility of the Center. This responsibility will continue to rest with the appropriate Colleges and their Departments.

Third, the Center should clearly help existing Departments develop relevant problem-focused curricula in environmental studies at both the graduate and undergraduate level. Innovation is especially needed here, since problem-oriented courses will of necessity be significantly different from those in the usual academic disciplines.

Fourth, students should be involved not only in special course work but also in all research programs organized under the Center. In this area, under-graduate students can play a significant role, and many are strongly motivated to do so. Techniques should be worked out which give students the opportunity to be heard on matters of program direction and goals.

Fifth, since programs undertaken by the Center will all relate to the quality of life as affected by the environment, it is very desirable that faculty members representing the various humanities disciplines be encouraged to participate in the work of the Center.

Sixth, the Center will serve as a central repository of technical information and data concerning environmental quality, and must be capable of making such information available to industry, state and local government agencies, other academic institutions, and others having a legitimate interest. It is to be anticipated that much of this information will be channeled through the Extension Division to serve Maryland's interests.

F. Recruitment

We recommend that the State Department of Education provide annually one or more attractive and informative leaflets or brochures for distribution in every secondary school in the state to inform students of the variety of opportunities open to them in the state for technical-professional training in environmental areas, and the locations of liberal-arts majors in environmental studies.

Respectfully submitted,

/s/

Don A. Emerson, Chairman
Belva L. Jensen
Ruth C. Wylie

TABLE A

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| College | Program | Degrees Offered or Planned* | Number of Courses Open To All - Few or No Prerequisites | Number of Teacher Training Courses |
|---|---|---|---|---|
| (Two-Year Colleges) | | | | |
| Allegany Community College | Forestry Technology | A.A. | 12 | 0 |
| Anne Arundel Community College | Conservation | (A.A.) | 1 | 0 |
| | Environmental Technician | (A.A.) | | |
| | Urban Development Assistant | (A.A.) | | |
| | Ocean Engineering Technician | A.A. | | |
| Baltimore College of Commerce | | | | |
| Baltimore Hebrew College | | | | |
| Bay College | Wildlife Management | (A.A.) | 24 | 0 |
| | Recreational Ecology | (A.A.) | | |
| | Water & Waste Water Technology | A.A. | | |
| | Pollution Control Technology | A.A. | | |
| | Environmental Community Planning | A.A. | | |
| | Natural Resources Management | A.A. | | |
| | Urban Ecology | A.A. | | |
| Catonsville Community College | Air Pollution Control Technology | (A.A.) | 10 | 0 |
| Cecil Community College | | | 11 | 5 |
| Charles County Community College | Environmental Technology | A.A. | 6 | 5 |
| | Pollution Abatement | A.A. | | |
| | Estuarine Resources Technology | A.A. | | |
| Chesapeake College | Ocean Engineering Technology | A.A. | 10 | 6 |
| Community College of Baltimore | Traffic & Transportation | (A.A.) | 1 | 0 |
| | Highways Technician | (A.A.) | | |
| | Ocean Engineering Technician | (A.A.) | | |
| | Urban Development Assistant | (A.A.) | | |
| | Building Inspector | (Cert.) | | |
| Essex Community College | Traffic & Transportation | (A.A.) | 2 | 0 |
| | Urban Development | (A.A.) | | |
| | Environmental Science Technician | (A.A.) | | |
| Frederick Community College | Environmental Science Technology | (A.A.) | 4 | 0 |
| Hagerstown Community College | | | | |
| Harford Junior College | | | 2 | 0 |

* Parentheses indicate programs in planning stages.

| College | Program | Degrees Offered or Planned* | Number of Courses Open To All - Few or No Prerequisites | Number of Teacher Training Courses |
|---|---|---|---|---|
| (Two-Year Colleges), Cont'd. | | | | |
| Montgomery College | Traffic & Transportation | (A.A.) | 5 | 0 |
| | Environmental Technology | (A.A.) | | |
| | Urban Development Assistant | (A.A.) | | |
| | Geography, Cartograhpy & Community Planning | A.A. | | |
| Mt. Providence Junior College | | | 5 | 0 |
| New Israel Rabbinical College | | | 1 | 1 |
| Prince George's Community College | | | | |
| Villa Julie College | Environmental Health | A.A. | | |
| Xaverian College | | | | |
| (Four-Year College and Universities) | | | | |
| Bowie State College | | | | |
| College of Notre Dame | Teaching Biology | B.S. | 12 | 1 |
| Columbia Union College | | | | |
| Coppin State College | Teaching Biology | B.S. | 44 | 1 |
| Frostburg State College | Biology | A.B. | | |
| | Teaching Biology | B.S. | | |
| | Teaching Biology | M.Ed. | | |
| | Biology | (M.S.) | | |
| Goucher College | Teaching Biology | B.S. | 4 | 3 |
| Hood College | Teaching Biology | B.S. | | |
| Johns Hopkins University | Geography & Environmental Eng. | M.S.E., B.A., M.A., Ph.D. | 9 | 0 |
| | Environmental Health | Dr. of Sc. | | |
| | Environmental Medicine | Master of Public Health | | |
| | Epidemiology | Dr. of -- | | |
| | Population & Family Health | Dr. of -- | | |
| | Air Pollution Specialist & General Environmental Health Spec. | | | |
| | Radiological Health Specialist | | | |
| | Ecological & Physiological Aspects of Comparative Behavior | | | |
| Loyola College | | | 8 | 0 |
| Maryland Institute | | | 4 | 1 |

TABLE A, Page 3

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| College | Program | Degrees Offered or Planned* | Number of Courses Open To All - Few or No Prerequisites | Number of Teacher Training Courses |
|---|---|---|---|---|
| (Four-Year Colleges and Universities), Cont'd. | | | | |
| Morgan State College | Teaching Biology | B.S., M.S. | | |
| Mt. St. Agnes College | Teaching Biology | B.S. | | |
| Mt. St. Mary's College | Teaching Biology | B.S. | | |
| Salisbury State College | Teaching Biology | B.S. | | |
| St. John's College | | | | |
| St. Joseph's College | Teaching Biology | B.S. | 14 | 1 |
| St. Mary's College of Maryland | Teaching Biology | B.S. | | |
| St. Mary's Seminary & University | | | | |
| Towson State College | Biology | B.S., M.S. | 29 | 4 |
| | Teaching Biology | B.S., M.S. | | |
| | Environmental Health | ( ) | | |
| | Suburban Studies | (B.S.) | | |
| United States Naval Academy | Oceanography | | 3 | 0 |
| University of Baltimore | Transportation | B.S. | | |
| University of Maryland | Agronomy | B.S., M.S., Ph.D. | 73 | 9 |
| | Entomology | B.S., M.S., Ph.D. | | |
| | Horticulture | B.S., M.S., Ph.D. | | |
| | Geography | B.S. or B.A., M.A., Ph.D. | | |
| | Civil Engineering - Concentration in Environmental & Water Resource Engineering | B.S., M.S., Ph.D. | | |
| | Health Education | B.S., M.A., Ph.D. | | |
| | Institute of Natural Resources | None | | |
| | Environmental Design | B.A., B.S. (1972)<br>M.S. (1975) | | |
| | Urban Planning | M.S. (M.U.P.) (1972) | | |
| | Environmental Health Sanitation | M.S. (1972)<br>Ph.D. (1977) | | |
| | Human Ecology | B.S. (1974)<br>B.A. (1974)<br>M.A. (1974) | | |
| | Environmental Perception | M.A. (1973) | | |
| | Environmental Planning | M.A. (1972)<br>Ph.D. (1975) | | |

| College | Program | Degrees Offered or Planned* | Number of Courses Open To All - Few or No Prerequisites | Number of Teacher Training Courses |
|---|---|---|---|---|
| University of Maryland, Cont'd. | Environmental Sciences | Ph.D. (1972) | | |
| | Fish & Wildlife Biology | Ph.D. (1972) | | |
| | Geophysical Sciences | M.S. (1972) | | |
| | | Ph.D. (1975) | | |
| | Oceanography | Ph.D. (1972) | | |
| | Environmental Engineering - Air Quality Control | | | |
| | Environmental Engineering - Water Quality Management | | | |
| | Environmental Engineering - Environmental Health Eng. | | | |
| | Environmental & Water Resource Engineering | | | |
| | Social Planning & Social Strategy Leading | | | |
| | Biochemical Toxicology | ( ) | | |
| Washington College | | | 2 | 0 |
| Western Maryland College | Teaching Biology | B.S., M.S. | 3 | 3 |
| | Program in Forestry - (In cooperation with School of Forestry, Duke University) | | | |

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APPENDIX G

REPORT OF THE JOINT COMMITTEE ON ENVIRONMENTAL CENTERS
OF THE
GOVERNOR'S COMMISSION ON ENVIRONMENTAL EDUCATION
AND
SUPERINTENDENT'S TASK FORCE ON ENVIRONMENTAL EDUCATION

## PURPOSES OF ENVIRONMENTAL CENTERS IN MARYLAND

All of the purposes to be served should be clearly and specifically related to the definition and objectives established by both the Governor's Commission and the Task Force. The report of the Joint Committee on Objectives served as a guideline.

An Environmental Center is a facility which permits the following:

1. Effective presentation of a week of intensive experience in relation to the environment for middle school children (grades 5 to 8) working in the general region of their own environment in the sense of urban, suburban or rural. This should be direct personal experience, supplemented by appropriate activities.

2. Permits more advanced students (grades 8 to 12) to spend a comparable week in a distinctly different environmental setting with equal intensity, personal experience and good teaching.

3. Permits day visits of many kinds from regional schools and groups with appropriate programs for students and other potential users.

4. Provides adult programs, including both formal arrangements such as courses and seminars and informal opportunities for families and small groups to come to a stimulating place and learn effectively about the interactions between people and their environment.

5. Permits excellent training of teachers at all levels in relation to the environment and the kinds of personal experience which will be both instructive and stimulating for those teachers.

6. Provides a central source of materials relating to environmental education, the site for the production of new and improved materials for use in schools and by adult groups or other consumers.

7. Permits excellent graduate research in environmental education in coordination with the appropriate institutions of higher learning.

POTENTIAL ACTIVITIES AT ENVIRONMENTAL CENTERS

1. Group living for visiting students and staff. This will involve appropriate and manageable facilities for sleeping, eating and recreation.

2. Excellent and varied first-hand experience with the appropriate environment.

3. Adequate large meetings which can encompass the entire residential group at the Center.

4. Meetings on the scale of class seminars and discussions.

5. Easy and effective movement from the physical center to nearby focal points of environmental interest.

6. Sufficient facility and arrangement for efficient administration.

7. Well-managed resource and library center.

8. Laboratories for suitable programs in natural ecology of both the urban and suburban kinds of areas.

9. Laboratory-like activities, as yet only partially defined, which involve the student in the learning process and approach to problems in the urban environment.

10. Optimal interaction with appropriate governmental agencies which deal with environmental problems or have an impact on the environment.

SCALE OF THE NEED

1. There are about 900,000 students in public schools plus kindergarten students plus private and parochial schools of Maryland plus the adult population. Precise figures are not available but the total population of school students alone is obviously over a million and will expand.

2. Maryland has about 30,000 teachers.

3. The eventual annual capacity of the total system of Centers should be about 100,000 students per grade. Since we propose that a week long experience be provided at two grade levels, total student service in a year would be about 200,000 plus adult education.

4. We consider that 150 people is the basic unit. This is the largest number that should ever be within sight or other sensory perception of each other. Such units can, of course, be arranged in suitable fashion at several locations in the same general tract of land.

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5. We expect that it would be desirable to reach about one-tenth of the total teaching population in Maryland each year. Thus 3,000 teachers would be involved in pre-service teacher training, in-service education for teachers, and exposure of teachers coming into the state from other sources.

6. Adult educational opportunities should be available for formal education courses, seminars, lectures and a wide variety of other means of stimulating and communicating. A group should never be larger than 50 although each Center should have a meeting place which can accommodate about 100 to 150 people for larger discussion activities.

7. Such Centers provide an unusually fine opportunity for the use of docent service by interested non-professionals, by individuals who may have taught or worked in related professional fields at one time and wish to contribute their efforts, or other individuals who can contribute to the total environmental education program.

8. It is our present estimate that 200,000 people at 150 students per unit will eventually require 33 units if offerings are made throughout 50 weeks of the year. They will require about 50 units if offerings are restricted to a 36-week period approximately comparable to the school year.

9. The first rough estimate of the cost of a unit suggests that it may approach a million dollars for facilities and may require about $200,000 a year for minimal operating expenses.

THE LOCATION OF MARYLAND ENVIRONMENTAL EDUCATION CENTERS

1. If we are to reach the principal geographic, cultural and population regions of Maryland, we must provide facilities at:

   a. Rural sites on the Eastern Shore, Western Shore, Central Maryland and Western Maryland.

   b. Sites related to the Chesapeake Bay and Atlantic Ocean.

   c. The urban centers.

   d. The suburban regions.

2. In surveying a Maryland map with interest in selecting sites which provide suitable variety, which take advantage of public-owned land or facilities, and which are reasonably related to population distribution, the following broad possibilities were identified:

   a. Atlantic coast area - Shad Run and Milburn Landing State Parks.

b. Eastern Shore - Horn Point and Elk Neck State Park.

c. Chesapeake Bay - Calvert Cliffs and perhaps Cedarville State Park.

d. City and suburban environment - Baltimore City, the region generally southwest of Baltimore, and the Washington suburban region.

e. Central and mountain Maryland - Savage River State Forest, Gambrill State Park and Cunningham State Park.

3. Priorities should be established and a program should be developed which takes advantage of the concept of creating at least two diverse centers in order to gain experience which can be used in planning, developing and operating the rest of the system. Toward this concept, we found ourselves in strong and unanimous agreement that at least two centers should be initiated at the earliest possible date. These might not include all of the eventual units but they should be sufficient to serve the purpose of prototypes. They are:

a. An Environmental Center at the Horn Point property which is proposed as a Center for Environmental and Estuarine Studies for the University of Maryland.

b. A central city environmental center in Baltimore.

c. A third certer may be possible in coordination with existing facilities and programs at a college, university or state agency.

For these, planning money should be obtained in fiscal 1972 and plans should be rapidly developed by an excellent team of appropriate people, perhaps including outside expertise and experience. Capital funds should be obtained and the centers should be well developed in fiscal 1973 to show major progress in meeting this need in Maryland.

4. We propose that two or three centers be developed as the first step but we wish to emphasize that the proper objective is an entire state-wide system, fully adequate for the total population of Maryland. Lesser objectives should not be accepted as meeting the needs of the next generation.

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SUPPORT OF MARYLAND ENVIRONMENTAL CENTERS

1. The Federal Government.

The contribution could consist of funds for planning, for the expense of students, for staff, for construction of facilities. It might also include provision of land and facilities for Centers.

2. The State Government.

The state departments would act as the pipeline for federal funds, as the lead agency for the program, as a coordinator among all pertinent activities, to provide suitable land, and to govern the educational programs offered. The Departments of Natural Resources, Health and Mental Hygiene, Planning, Transportation and other state agencies would be especially valuable resources in the educational program.

3. County Governments.

These might best provide land, support staff, arrange and provide transportation and contribute to the materials and equipment necessary at the Centers. Their educational staffs and programs must be intimately involved in the planning and conduct of programs at the Centers.

4. City Government.

The provisions would be the same as those for the county.

5. The University of Maryland and appropriate colleges of the state.

These might provide land, special educational staff including that of the Natural Resources Institute, faculty for some of the Centers, and undergraduate and graduate students to participate with very high value in such programs.

6. Private individuals, corporations and philanthropies.

The principal support could be through funding but it might also be appropriate to contribute land, equipment and other special support.

PROGRAM DIRECTION AT MARYLAND ENVIRONMENTAL CENTERS

1. The State Department of Education should design and coordinate the educational programs at the Centers.

2. County and city educational systems must be actively and continuously involved in planning programs and especially in their conduct.

3. Local citizen groups should be encouraged to make the fullest possible use of the Centers and to contribute suggestions and support to the program.

4. State and federal agencies related to resources and environmental matters should be encouraged to take a major role at some of the Centers.

5. Colleges and universities should assist local Center programs as well as utilize the Centers in their own projects.

Respectfully submitted,

/s/
L. Eugene Cronin, Chairman
Joseph Howard
James W. Latham, Jr.
James Nelson
Elra Palmer

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APPENDIX H

ROSTER OF SOME ENVIRONMENTAL EDUCATION ORGANIZATIONS
AND EFFORTS IN MARYLAND

American Can Company
American Cancer Society (Local Branches)
American Telephone and Telegraph
Antioch College - Human Ecology Center - Columbia
Baltimore County Health Department, Division of Air Pollution
Baltimore County Public Library
Baltimore Institute and Junior College
Better Air Coalition
Charles County Community College
Coca-Cola Bottling Company
College Park Metallurgy Research Center
Conservation Clearinghouse
Conservation Education Council of Maryland
Cooperative Extension Service - University of Maryland
Division of Tourism - Newsletter
Ecology Action
Essex Community College
Fish and Wildlife Administration - DNR (Newsletter and Magazine)
4-H
Garrett County Science Center
Girl Scouts
Greater Baltimore Citizens for Clean Air, Inc.
Hittman Associates - Columbia
Howard County Committee for Environmental Quality
Howard County Community College
Isaac Walton League
Johns Hopkins University
Keep Maryland Beautiful
Maryland Academy of Sciences
Maryland Environmental Services - DNR
Maryland Environmental Trust
Maryland Geological Survey
Maryland Marine Police Division, Department of Chesapeake Bay Affairs
Maryland State Department of Education
Maryland State Department of Health and Mental Hygiene (Literature)
Maryland State Department of Natural Resources (Newsletter, Md. Environmental Gram)
Montgomery County Public Schools
National Labor Relations Board
National Training Labs - Urban Life Center - Columbia
Natural Resources Institute - University of Maryland
News American
Owens-Illinois, Inc.
Peabody Engineering, Power and Combustion Division
Pratt Library
Prince George's County Memorial Library
Sanitation Division, Bureau of Utility Operations, City of Baltimore
Sen. Wm J. Goodman (Newsletter on environmental legislation)
Sierra Club
Sunpapers

The Columbia Association
The Columbia Flier
The Rouse Company - Columbia
Tuberculosis Association - (Local Branches)
WBAL Radio
WBAL-TV
WJZ-TV
WMAR-TV
Wye Institute
Zero Population Growth